

Application Number 09/730,199
Amendment dated January 30, 2004
Responsive to advisory Office Action of January 12, 2004

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently amended): A data storage medium comprising:

- a first layer comprising a substrate;
- a second layer including a photopolymer, the second layer exhibiting surface variations, wherein the photopolymer is pre-written with the surface variations and cured; and
- a third layer including a magnetic recording material and substantially conforming to the surface variations of the second layer, wherein the third layer including the magnetic recording material forms a substantially continuous layer over the surface variations.

Claim 2. (Canceled)

Claim 3 (Previously Presented): The data storage medium as described in claim 1, wherein the first layer is a disk-shaped substrate.

Claim 4 (Previously Presented): The data storage medium as described in claim 1, wherein the first layer provides rigidity and mechanical stability to the medium.

Claim 5 (Previously Presented): The data storage medium as described in claim 1, wherein the first layer comprises one of the following: glass, aluminum, aluminum-magnesium alloy, ceramic and plastic.

Claim 6 (Currently amended): The data storage medium as described in claim 1, wherein the photopolymer includes a photopolymerized material.

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Claim 7 (Currently amended): The data storage media as described in claim 6, wherein the photopolymer comprises at least 30% by weight of radiation polymerized components selected from epoxy-terminated silanes.

Claim 8 (Original): The data storage medium as described in claim 1, wherein the surface variations are machine-readable data patterns.

Claim 9 (Original): The data storage medium as described in claim 8, wherein the data patterns include data bumps.

Claim 10 (Original): The data storage medium as described in claim 9, wherein at least some of the data bumps comprise encoded data.

Claim 11 (Original): The data storage medium as described in claim 1, wherein the surface variations are protrusions.

Claim 12 (Original): The data storage medium as described in claim 11, wherein the surface variations include at least one of the following: bumps, rails, lands and ridges

Claim 13 (Original): The data storage medium as described in claim 1, wherein the surface variations are depressions.

Claim 14 (Original): The data storage medium as described in claim 13, wherein the surface variations include at least one of the following: pits, grooves, and channels.

Claim 15 (Original): The data storage medium as described in claim 1, wherein the surface variations contain servo patterns.

Claim 16 (Original): The data storage medium as described in claim 1, wherein the surface variations contain tracking patterns.

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Claim 17 (Previously Presented): The data storage medium as described in claim 1, wherein the surface variations project from the medium a height less than 50 nanometers.

Claims 18-19 (Canceled)

Claim 20 (Previously Presented): The data storage medium as described in claim 1, wherein the third layer comprises a thin film stack including an underlay, the magnetic recording material, and a hard coat.

Claim 21 (Currently amended): The data storage medium as described in claim 20, wherein the underlay includes a chrome alloy and the magnetic recording material includes a cobalt alloy.

Claim 22 (Original): The data storage medium as described in claim 21, wherein the hard coat includes at least one of the following: carbon, nitrogenated-carbon, and hydrogenated-carbon.

Claim 23 (Previously Presented): The data storage medium as described in claim 1, wherein the third layer further includes a buffer.

Claim 24 (Previously Presented): The data storage medium as described in claim 1, further comprising a fourth layer substantially conforming to the surface variations.

Claim 25 (Original): The data storage medium as in claim 24, wherein the fourth layer includes a lubricating material.

Claim 26 (Previously Presented): The data storage medium as in claim 25, wherein a medium surface is flyable.

Claim 27 (Currently amended): A data storage medium comprising:

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a substantially rigid substrate;

a photopolymer containing surface variations, wherein the photopolymer is pre-written with the surface variations and cured;

a thin film stack substantially conforming to the surface variations, comprising a plurality of sub-layers, and including an underlayer, a magnetic recording material and a hard coat; and
a lubrication layer substantially conforming to the surface variations,
wherein the surface variations are arranged in a machine-readable pattern.

Claim 28 (Currently amended): A data storage medium comprising:

a flexible contact media substrate;

a photopolymer containing surface variations, wherein the photopolymer is pre-written with the surface variations and cured;

a thin film stack substantially conforming to the surface variations and comprising a plurality of sub-layers, and including an underlayer, a magnetic recording material and a hard coat;
and

a lubrication layer substantially conforming to the surface variations,
wherein the surface variations are arranged in a machine-readable pattern.

Claim 29 (Currently amended): A data storage medium comprising:

a substantially transparent plastic substrate including optically detectable features;

a reflective layer to facilitate optical detection of the optically detectable features via reflection of an optical signal;

a photopolymer containing surface variations, wherein the photopolymer is pre-written with the surface variations and cured;

a thin film stack comprising a plurality of sub-layers, including an underlayer, a magnetic recording material and a hard coat, and substantially conforming to the surface variations; and
a lubrication layer substantially conforming to the surface variations,
wherein the surface variations are arranged in a machine-readable pattern.

Claim 30 (Currently amended): A data storage medium comprising:

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a first data storage layer;

a second data storage layer, the second data storage layer including a photopolymer containing surface variations, wherein the photopolymer is pre-written with the surface variations and cured;

a thin film stack comprising a plurality of sub-layers, including an underlayer, a magnetic recording material and a hard coat, and substantially conforming to the surface variations; and
a lubrication layer substantially conforming to the surface variations,
wherein the surface variations are arranged in a machine-readable pattern.

Claim 31 (Currently amended): A removable hard disk unit comprising:

a housing; and

a data storage unit within the housing comprising:

a first layer comprising a substrate;

a second layer including a photopolymer, the second layer exhibiting surface variations, wherein the photopolymer is pre-written with the surface variations and cured;
and

a third layer including a magnetic recording material and substantially conforming to the surface variations of the second layer, wherein the third layer including the magnetic recording material forms a continuous layer over the surface variations.

Claim 32 (Currently amended): A system comprising:

a housing;

a flying head transducer within the housing; and

a data storage unit within the housing comprising:

a first a layer comprising substrate;

a second layer including a photopolymer, the second layer exhibiting surface variations, wherein the photopolymer is pre-written with the surface variations and cured;
and

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a third layer including a magnetic recording material and substantially conforming to the surface variations of the second layer, wherein the third layer including the magnetic recording material forms a continuous layer over the surface variations.

Claim 33 (Withdrawn): A method comprising:
providing a substrate;
applying a polymer film on the substrate;
creating one or more surface variations on the film;
applying an additional layer over the film such that the additional layer substantially conforms to the surface variations.

Claim 34 (Withdrawn): The method of claim 33, further comprising applying a plurality of additional layers over the film such that the plurality of additional layers substantially conform to the surface variations.

Claim 35 (Withdrawn): The method of claim 33, wherein applying a film on the substrate comprises spin coating the substrate.

Claim 36 (Withdrawn): The method of claim 33, wherein applying a film on the substrate comprises roll coating the substrate.

Claim 37 (Withdrawn): The method of claim 33, wherein creating one or more surface variations comprises stamping the film with a stamper.

Claim 38 (Withdrawn): The method of claim 33, wherein applying a film on the substrate and creating the one or more surface variations comprises an injection molding process.

Claim 39 (Withdrawn): The method of claim 33, wherein applying a film on the substrate and creating the one or more surface variations comprises a rolling bead process.

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Claim 40 (Withdrawn): The method of claim 33, wherein the polymer film comprises less than 1% solvent.

Claim 41 (Withdrawn): The method of claim 33, wherein the polymer film comprises at least 30% ambifunctional silanes.

Claim 42 (Withdrawn): The method of claim 33, wherein the polymer film comprises at least 15% heterocyclic acryloyloxy materials.

Claim 43 (Withdrawn): The method of claim 33 wherein the polymer film comprises 30% to 70% hydantoin hexacrylate.